

The Effects of Motivational Versus Instructional Self-Talk on Improving Motor Performance

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This study examined the effectiveness of different self-talk strategies on increasing performance in different motor tasks. Specifically, four laboratory experiments were conducted to examine the effect of motivational versus instructional self-talk strategies on four different tasks. Included in the experiments were a soccer accuracy test, a badminton service test, a sit up test, and a knee extension task on an isokinetic dynamometer. Results of the first two experiments indicated that only the participants of the instructional group improved their performance significantly more than the motivational and control groups. Results of the third experiment indicated no significant differences between the three groups, although all groups showed improvements across trials. Results of the fourth experiment showed a significant improvement for both the motivational and instructional groups compared to the control group. It appears that when the task requires fine motor movements, an instructional self-talk strategy is more effective, whereas when the task requires predominantly strength and endurance, both motivational and instructional strategies are effective.

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Cognitive strategies involve active mental processes designed to change or influence existing thought patterns. One of the most pervasive of the cognitive strategies employed by athletes (especially elite athletes) is self-talk (e.g., Gould, Eklund, & Jackson, 1992, 1993). Anecdotal reports (e.g., Galloway, 1974) and descriptive research dating back to the 1970s has shown that athletes extensively and consistently use self-talk to enhance motivation, build confidence, and provide cues for physical performance (Mahoney & Avenier, 1977; Meyers, Schlessner, Cooke, & Culliver, 1979; Rushall, 1984; Van Raalte, Brewer, Rivera, & Petitpas, 1994; Weinberg, Grove, & Jackson, 1992). Simply put, self-talk describes what people say to themselves either out loud or as a small voice inside their head. This self-talk tends to be either positive or negative and rarely neutral (Sellars, 1997). According to Anderson (1997), self-talk is what learners say to themselves to think more precisely about their performances and to direct their actions in response to those reflections. In tennis, for example, positive self talk helps a player to stay appropriately focused on the present, not dwelling on past mistakes or projecting too far into the future (Weinberg, 1988). Conversely, self-talk that gets in the way because it is inappropriate, irrational, counterproductive, or anxiety-producing is called negative self-talk.

Following up on the earlier anecdotal reports of the effectiveness of positive self-talk on performance, empirical studies have started to investigate the effects of self-talk on performance in a variety of domains, especially academic (e.g., Manning, 1988; Nakano, 1991; Solley & Payne, 1990). In the applied sport psychology literature, much attention has been focused on the benefits of positive self-talk and the deleterious effects of negative self-talk, although most early studies still were not experimental in nature. For example, Rotella, Gansneder, Ojala, and Billing (1980) found that elite skiers who were termed successful versus less successful did not differ in terms of their self-talk. Similarly, elite Ivory Coast athletes reported using the same type of self-talk for their best and worst performances (Dagrou, Gauvin, & Halliwell, 1991). Finally, Highlen and Bennett (1983) found that elite wrestlers who qualified for the Pan American Games used more positive self-talk than wrestlers who did not qualify.

Despite the lack of support for the use of positive self-talk in the above early investigations, proponents of positive self-talk have suggested that it can reduce anxiety, increase effort, and enhance self-confidence (Finn, 1985; Weinberg, 1988). Along these lines, Zinsser, Bunker, and Williams (1998) suggest that simple cues such as "step, swing" in tennis, "step, drop, step, kick" for a soccer punt, and "arms straight, elbows in" for the golf address are designed to foster cognitive associations that will aid the athlete in learning proper physical execution.

Along these lines, the large majority of studies confirm the positive effect of self-talk on performance. For example, Weinberg, Smith, Jackson, and Gould (1984) found that positive self-talk was an effective strategy in enhancing endurance performance. Hamilton and Fremour (1985) in a basketball task have shown that the use of positive thoughts increased performance while negative thoughts decreased it. Ziegler (1987) explored the effects of self-talk in beginning tennis classes by devising a set of four instructional cues, which prompted a narrow-external focus of attention throughout the task. Results revealed significant and sustained improvements in performance of the forehand ground strokes for these beginning tennis players. Rushall, Hall, Roux, Sasseville, and Rushall (1988) found that the

three forms of self-talk they had used in a ski task (positive self-statements, mood words, and task-relevant statements) all significantly improved performance. Moreover, Dagrou, Gauvin, and Halliwell, (1992) using dart throwing, found that positive self-talk results in better performance than negative self-talk.

More recently, Van Raalte et al. (1994) systematically observed self-talk of junior tennis players. Results indicated that winners use less negative self-talk than losers, although overall, players displayed more negative than positive self-talk. Van Raalte et al. (1995), using a dart throwing task, found that athletes who had used positive self-talk performed significantly better than athletes who had used negative self-talk. Ming and Martin (1996), in a single-subject evaluation of self-talk in figure skating, found that the use of self-talk enhanced competitive performance. Finally, Mallett and Hanrahan (1997) demonstrated that the use of a predetermined self-talk plan produced positive effects on the performance of a 100 meters dash. In summary, the above studies as well as others (e.g., Johnson-O'Connor, & Kirschenbaum, 1986; Kirschenbaum, Ordman, Tomarken, & Holtzbaumer, 1982) have generally found that positive self-talk produces significantly better performance than does negative self-talk.

Thus, there appears to be a growing literature attesting to the potential positive effects of positive self-talk on improving sport as opposed to the use of negative self-talk. However, there has been a dearth of literature focusing on the effectiveness of different types of positive self-talk. For example, according to Zinsser et al. (1998), the two primary functions of self-talk are motivational and instructional in nature. Specifically, the motivational functions of self-talk are thought to facilitate performance by enhancing confidence, inspiring greater effort and energy expenditure, and by creating a positive mood. Examples of motivational self-statements include statements such as "you can do it," "hang in there," "strong," and "get tough." Conversely, the instructional function of self-talk is thought to enhance performance by triggering desired actions through proper attentional focus, correct technique, and strategy execution (Hardy, Jones, & Gould, 1996). Some examples of instructional self-talk include "elbow straight," "reach," "stay low," and "move your feet."

One study, which investigated the effects of different types of self-talk, compared the use of task-relevant ("full movement range"), mood ("blast, rip"), and positive ("I feel great") self-statements of elite skiers (Rushall, et al., 1988). Results revealed that 16 of 18 skiers in all three self-statement conditions improved their performance. In addition, a recent study that investigated the effects of positive, instructional, negative, or no self-talk indicated that for golfers of all skill levels, instructional self-talk may be the best type of self-talk to use to enhance performance (Harvey, Van Raalte, & Brewer, 2000). However, outside these studies, little empirical research has been conducted in the sport domain focusing on the effectiveness of different types of self-talk. The lack of empirical research focusing on the best type of self-talk to enhance performance is captured in the following quote by Hardy et al. (1996). "Despite the strong emphasis that mental training programs often place upon the development of appropriate self-talk, relatively few controlled studies have been performed that would enable any sort of empirically based operationalization of the word 'appropriate' to be attempted" (p. 35). Therefore, the primary purpose of the present investigation was to examine the effectiveness of motivational versus instructional self-talk by using four different

motor tasks. Since motivational self-talk usually focused on increasing energy, effort, and positive effect, and instructional self-talk focused on technical aspects of skilled performance, it was thought that the effectiveness of these two self-talk techniques might vary based on the nature of the task being performed. Specifically, it was hypothesized that instructional self-talk would be more beneficial for tasks requiring more skill, timing, and precision, since specific instructional cues could help the execution of the desired movement pattern through proper attentional focus on relevant performance cues (Landers & Boutcher, 1998; Nideffer & Sagal, 1998). Conversely, it was hypothesized that motivational self-talk would be more helpful for tasks requiring more strength and endurance, because the focus here is on increased energy and effort expenditure. Along these lines, research has indicated that increases in arousal and positive mood are generally related to increases in performance on strength and endurance tasks (Landers & Boutcher, 1998; Raglin & Hanin, 2000). Therefore, four different experiments were designed, each using a different task that emphasized either more strength and endurance or more precision and accuracy. The four tasks included a passing task for accuracy in soccer, a serving task in badminton, an endurance 3 minute sit up, and a leg extension strength task.

Experiment 1 Method

Participants

The participants in this study were 72 male soccer players aged 12–16 years ($M = 13.56$, $SD = 1.17$). These players had been involved in systematic soccer training for at least one to three years.

Task

The passing test was a part of Mor and Christian's (1979) Soccer Ability Skill Test Battery. Psychometric testing of this test battery in its original development by Mor and Christian produced a test-retest reliability coefficient of .96. For the purpose of this test, a goal about 1 yard wide and 18 inches high was prepared by placing two cones 1 yard apart with a 4-foot rope used as a cross bar. Two cones are placed at a 45-degree angle from the goal line, and 1 cone is placed at a 90-degree angle from the line. All three cones are located 15 yards from the goal. From each of three cones, students make four passes into the goal (12 passes total). Participants were allowed to use their preferred foot when passing. One point was awarded for each successful pass. Balls that hit the goal cones are considered successful. The final score from one application of the test is the total of 12 pass trials.

Experimental Manipulation

For the purpose of this study, participants were split in two experimental groups and one control group. Participants had a 10 min warm-up and then they performed the first trial block in a "do your best" condition. A 10 min rest period was given to the participants to recover from fatigue. Participants performed the second trial block in a "do your best" condition. All participants performed their skill tests independently and alone and were told not to discuss the test with others. Following these baseline performance trials, participants were matched into triplets.

Participants were then split into equal groups according to their performance in the previous two trials. The first group was a control group, since they received no self-talk instructions. The first experimental group was instructed to use a motivational self-talk strategy and repeat the words "I can" before each attempt. The second experimental group was instructed to use an instructional self-talk strategy and repeat the phrase "I see the target." After that, the 3 groups performed 4 additional trial blocks with a 10 min. rest period from trial to trial. Participants were told that they could repeat their self-statements out loud or silently to themselves, although most choose to do it silently

Post-Experimental Manipulation

To obtain a manipulation check regarding the use and content of the self-talk cues used by participants just after the final experimental trials, two questions were asked: "Did you have in mind the content of the phrase you used?" and "Did you think that this phrase was helpful to your performance?"

Experiment 1 Results

Two one-way ANOVAs on the first two trials showed that there were no significant differences between the three groups before the experimental manipulation, $F(2, 71) = .014, p = .98$, for the first trial block and $F(2, 71) = .03, p = .97$, for the second trial block. To examine for possible group differences in performance across the six trials, a 3×6 (Group $\times$ Trials) mixed-model ANOVA was performed with self-talk groups serving as the between-subjects factor and the repeated performance trials serving as the within-subjects factor. Results revealed there was a significant group effect, $F(2, 69) = 4.80, p < .01$, with Scheffe post hoc tests revealing that the instructional group ($M = 5.34$) performed significantly better than motivational ($M = 4.59$) and control ($M = 4.44$) groups, $p < .01$. In addition, results also revealed a significant trials main effect, $F(5, 345) = 6.67, p < .001$. More specifically, post hoc tests indicated that subjects performed better on the fourth ($M = 4.96$), fifth ($M = 4.87$), and sixth trials ($M = 5.47$) than on the first ($M = 4.41$) and second ($M = 4.18$) trials. Significant differences were also found between the fifth to sixth trials ($p < .01$). Finally, results revealed a Group $\times$ Trial interaction, $F(10, 345) = 2.82, p < .002$. Scheffe's post hoc tests showed that the performance of the instructional group was significantly higher, $F(2.69) = 12.52, p < .001$, than the score either the control or the motivational groups at the 6th trial. No significant differences were found between motivational and control group on this trial. Means and standards deviations for the experimental and control groups for all four experiments are provided in Table 1, and results of Experiment 1 can be seen in Figure 1.

Since the results of the post-experimental questionnaire were open ended, only descriptive data are reported. A summary description includes the following: Approximately 95% of the participants in the instructional self-talk group reported that they were thinking about the phrase they were using. Furthermore, 88% of the instructional group reported that the self-talk helped them. All the participants (100%) in the motivational self-talk group reported that they were thinking the phrase they were given. In addition, 83% of the motivational group reported that the self-talk helped them.

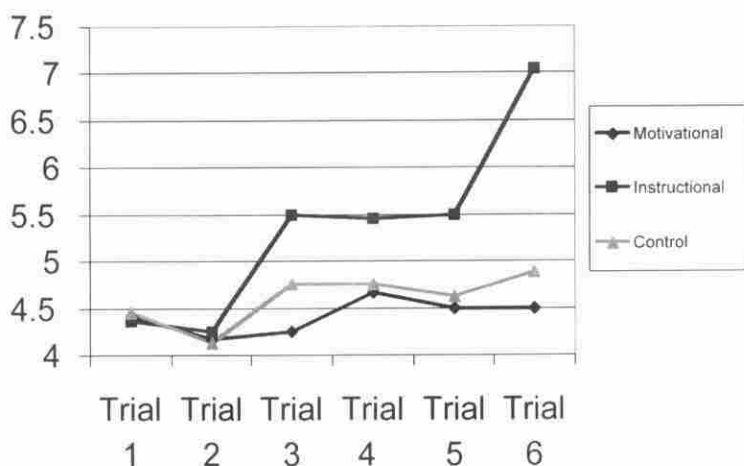


Figure 1 — Performance of the three groups across trials in a soccer skills task.

Experiment 2 Method

Participants

The participants in this study were 48 university students in Physical Education (20 females, and 28 males) who had completed a course of badminton. Their ages ranged from 18 to 24 years ($M = 20.6$, $SD = 1.78$). Again, participants were split in two experimental groups and one control group.

Task

In this study, the French short serve (Scott, Carpenter, French, & Kuhl, 1941) was used as a measure of performance. The purpose of this test is to measure player's ability to serve accurately and low. Psychometric results from Scott et al.'s original development of the serve test revealed test-retest reliability at .96. This test can be used with players who have experience of the short serve and includes the following procedure. Four concentric quarters are drawn on the right service court. The circular lines are 1-1/2 in. wide and the width of them is included in the amount of each radius. The first quarter has a radius of 22 in., the second, 30 in., the third, 38 in., and the fourth, 46 in. The use of different colors for the circles helped make the scoring more consistent and accurate. A rope is stretched 20 in. above the net and parallel to it. Each serve could pass through the gap between the net and the rope and counts according to the area the shuttle bounces. The score is 5 points for the first quarter, 4 points for the second, 3 points for the third, 2 points for the fourth, and 1 point for the fifth quarter. The final score is the sum of the 10 serves in each trial (maximum 50 points).

Experimental Manipulation

Participants had a 10-min warm-up, doing general exercises and making few serves. Then they performed the first trial block, in a "do your best" condition. Although the task is not exhausting, a 5-min rest period was given to the participants to

recover from fatigue. Participants performed the second trial block in a “do your best” condition. All participants performed their skill tests independently and alone and were told not to discuss the test with others. Then participants were matched into triplets based on these initial performance trials and then randomly assigned to the treatment and control conditions. The first group was a control group as no self-talk instruction was provided. The first experimental group was instructed to use a motivational self-talk strategy, and repeat the words “I can” before each attempt. The second experimental group was instructed to use an instructional self-talk strategy, and repeat the phrase “I see the net, I see the target.” After that, the 3 groups performed 4 additional trial blocks with a 5-min rest period. Participants were told that they could repeat their self-statements out loud or silently to themselves although most chose to do it silently.

Post-Experimental Manipulation

Just after the end of the experimental manipulation, participants of each group completed a questionnaire. The questions in the control group were “Were you thinking about anything when you executing your serves?” and (if yes), “What were you exactly thinking?” The questions in the two experimental groups were “How often did you repeat your self talk statement?” and “Do you believe that this procedure was helpful to you?” Responses for these two questions were given on a 10-point scale from 0 (*not at all*) to 10 (*always*).

Experiment 2 Results

Two one-way ANOVAs on the first two trials indicated that there were no significant differences between the three groups before the experimental manipulation, $F(2, 47) = .32, p = .72$, for the first trial block and $F(2, 47) = .71, p = .49$ for the second trial block. To examine for possible group differences in performance across the six trials, a 3 × 3 × 6 (Group × Trials) mixed-model ANOVA was performed with self-talk groups serving as the between-subjects factor and the repeated measures performance trials serving as the within-subjects factor. Results reported significant main effects for groups, $F(2, 45) = 4.22, p < .02$, with Scheffe post hoc tests revealing that the instructional group ($M = 31.89$) performed significantly better than the control ($M = 26.20$) group, $p < .05$. In addition, results indicated a significant trials main effect, $F(5, 225) = 6.93, p < .001$. More specifically, post hoc tests indicated that participants performed better on the third ($M = 30.35$), fourth ($M = 30.14$), fifth ($M = 29.62$), and sixth trials ($M = 30.89$) than on the first trial ($M = 25.73$), all significant at $p < .001$. A significant difference was also found between the second ($M = 27.96$) and sixth trials ($M = 30.89$), $p < .001$. Performance results can be seen in Figure 2.

In addition, results revealed a significant Group × Trial interaction, $F(10, 225) = 1.91, p < .05$. Scheffe's post hoc tests revealed that the performance of the control group was significantly lower than the performance of the instructional group at the 3rd trial, $F(2, 45) = 4.85, p < .01$, and the 5th trial, $F(2, 45) = 3.08, p < .05$. In addition, performance of the instructional group in the 6th trial was significantly higher than the motivational and control groups, $F(2, 45) = 6.28, p < .001$.

The results of the questionnaire indicated that in the control group, 62% of the participants reported that they were thinking something specific when they were serving, while the remaining 38% of athletes reported they were simply

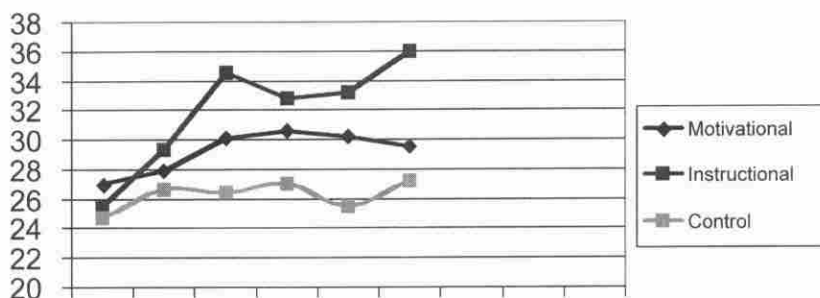


Figure 2 — Performance of the three groups across trials in a badminton serve task.

performing the serves. In response to the question “How often did you repeat your self talk statement,” results of a *t*-test revealed no significant differences with both the motivational self-talk group ($M = 7.12$) and the instructional self-talk group ($M = 8.37$), both appearing to be consistently using the self-statements cues. Regarding the question “Do you believe that this procedure was helpful to you,” results from a *t*-test revealed that the instructional self-talk group found their statements significantly ($p < .05$) more helpful ($M = 7.37$) than the motivational self-talk group ($M = 5.31$).

Experiment 3 Method

Participants

The participants in this group were 54 high school students. Their ages ranged from 15 to 20 years ($M = 16.9$, $SD = 1.3$). Again, participants were split in two experimental groups and one control group.

Experimental Test

The task was a 3-min sit-up test measuring endurance of the abdominal muscles from the supine position using procedures outlined by Matthews (1978). The only difference was that a duration of 3 min was applied in the present investigation, compared the original 1 min. It was felt that the extra time would provide an opportunity for subjects to be motivated by their self-talk statements than just performing sit-ups as fast as possible for 1 min. In contrast to the previous two studies where the tasks were fine movements with accuracy, this study focused on a task with a gross movement. The task also was chosen because it measured endurance, and the 3-min duration is fatiguing.

Experimental Manipulation

Participants had a 10-min warm-up, and then they performed the first trial in a “do your best” condition. Participants were split into three equal groups according to their performance in this first trial. Then, participants were examined again after a 5-day period due to the exhaustive nature of the 3-min sit-up. The first group was a control group. The first experimental group was instructed to use a motivational

self-talk strategy and repeated the words “I can” during the 3-min trial. The second experimental group was instructed to use an instructional self-talk strategy and repeated the phrase “breath out” during the 3-min trial. After that, the three groups performed the second trial. Following the same procedure, participants were examined after a 5-day period and performed the third trial.

Post-Experimental Manipulation

Just after the end of the experimental manipulation, participants of each group completed a questionnaire. The questions in the control group were “Did you think anything when you executing your sit-ups?” and (if yes), “What were you exactly thinking?” The questions in the two experimental groups were “How often did you repeat your self talk statement?” and “Do you believe that this procedure was helpful to you?” Responses to these two questions were given on a 10-point likert scale ranging from 0 (*not at all*) to 10 (*always*).

Experiment 3 Results

A one-way ANOVA on the first trial showed that there were not any significant differences between the three groups before the experimental manipulation, $F(2, 53) = .003, p = .99$. To examine for possible group differences in performance across the six trials, a 3×3 (Group $\times$ Trials) mixed-model ANOVA was performed with self-talk groups serving as the between-subjects factor and the repeated measures performance trials serving as the within-subjects factor. Results revealed that neither the Group $\times$ Trials interaction, $F(4, 102) = .97, p = .43$, or the group effect, $F(2, 51) = .04, p = .96$, were significant. However, the trials effect was significant, $F(2, 104) = 32.24, p < .001$. All the groups produced better performance scores from trial to trial. Scheffe post hoc tests indicated significant improvements from trial to trial throughout the testing ($p < .001$). Results can be viewed in Figure 3.

The results of the post experimental questionnaires revealed that in the control group, 53.4% of participants reported that they were thinking about something specific when they performing, while 46.6% reported that they were simply

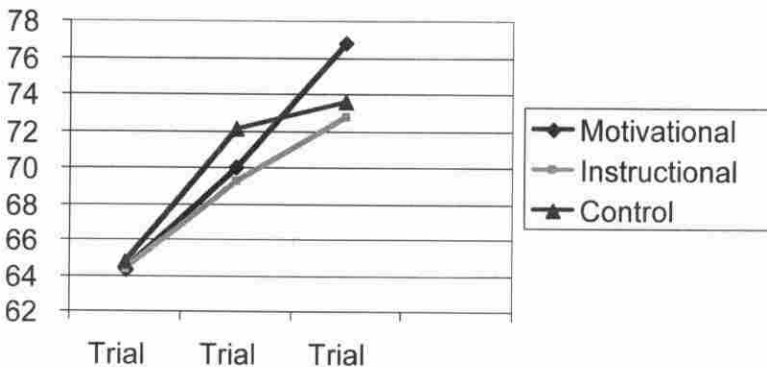


Figure 3 — Performance of the three groups across trials in a 3-min sit-up task.

performing the task. In considering the question "How often did you repeat your self-talk statement," both the motivational self-talk group ($M = 6.17$, $SD = 2.2$) and the instructional self-talk group ($M = 7.33$, $SD = 2.3$) appeared to be consistently using the self-statement cues. Regarding the question "Do you believe that this procedure was helpful to you?" again participants of both the motivational self-talk group ($M = 6.80$, $SD = 2.3$) as well as the instructional self-talk group appeared to find their self-statements helpful ($M = 7.30$, $SD = 2.3$). A *t*-test analysis between the two groups for these two questions indicated no significant differences.

Experiment 4 Method

Participants

The participants in this study were 63 university students in Physical Education (36 females, and 27 males). Their ages ranged from 18 to 33 years ($M = 20.98$, $SD = 2.82$). Again participants were split in two experimental groups and one control group.

Experimental Test

The participants in this study were examined in a knee extension task by using a CYBEX isokinetic dynamometer instrument. Knee extension was tested with the participants in a seated position with stabilization straps placed around their chest and waist. The angular velocity was set at 180°/sec. In each trial, the participants performed three repetitions at 100% of performance maximum effort. Participants were told that the total work of the sum of the three repetitions in each trial would served as the performance criterion as measured in Joules.

Experimental Manipulation

The warm-up for all subjects consisted of 5 min on an ergometric bicycle followed by three extension repetitions. For these repetitions, participants were told not to try too hard. Each participant completed a total of six trials (three repetitions per trial). After the warm-up, they were instructed to do their best and performed the first two trials. A 5-min rest period was given from trial to trial to enable the subjects to recover from fatigue. The mean scores of these two trials were computed and served as a pretest to help match participants based on ability.

Following these baseline trials, participants were split into three equal groups according to their performance in the previous two trials. The first group was a control group. One experimental group was instructed to use a motivational self-talk strategy and repeat the words "I can" before each attempt. The other experimental group was told to use an instructional self-talk strategy and repeat the phrase "I stretch fast and strong." After that, the 3 groups performed 4 additional trial blocks with a 5 min rest period from trial to trial.

Post-Experimental Manipulation

Just after the end of the experimental manipulation, participants of each group completed a questionnaire. The questions in the control group were "Did you think about anything when you executing the task?" and (if yes) "What exactly, were

you thinking about?" The questions in the two experimental groups were "How often did you repeat your self talk statement?" and "Do you believe that this procedure was helpful to you?" Responses for these two questions were given on a 10-point scale from 0 (*not at all*) to 10 (*always*).

Experiment 4 Results

A one-way ANOVA on the composite score of the first two trials showed that there were no significant differences between the three groups before the experimental manipulation, $F(2, 61) = .16, p = .84$. To examine for possible group differences in performance across the six trials, a 3×5 (Group $\times$ Trials) mixed-model ANOVA was performed with self-talk groups serving as the between-subjects factor and the repeated measures performance trials serving as the within-subjects factor (the first two baseline trials were computed and analyzed as one). Results indicated a significant Group by Trial interaction, $F(2, 59) = 16.90, p < .001$, although no significant main effects were found.

Results from Scheffe post hoc tests revealed that the performance of the control group was significant lower than the performance of the instructional group at the 3rd trial, $F = 6.00, p < .004$. In addition, for the final three trials, the performance of the control group was significantly lower than the instructional and motivational groups, $p < .001$. However, there were no significant differences between motivational and instructional groups on any of the trials. Performance results are depicted in Figure 4.

The results of questionnaire revealed that the 68.4% of participants in the control group reported that they were thinking something specific when they were performing, while 31.6% of participants reported they were simply performing the task. In response to the question "How often did you repeat your self talk statement?" both the motivational self-talk group ($M = 8.63, SD = 1.86$) and the instructional self-talk group ($M = 8.33, SD = 1.56$) appear to be consistently using the self-statement cues. Regarding the question "Do you believe that this procedure was helpful to you?" again both the motivational self-talk group ($M = 7.54, SD = 1.88$) and the instructional self-talk group ($M = 7.28, SD = 1.38$) appear to find their self-statements helpful. A *t*-tests analysis between the two groups for these two questions indicated no significant differences.

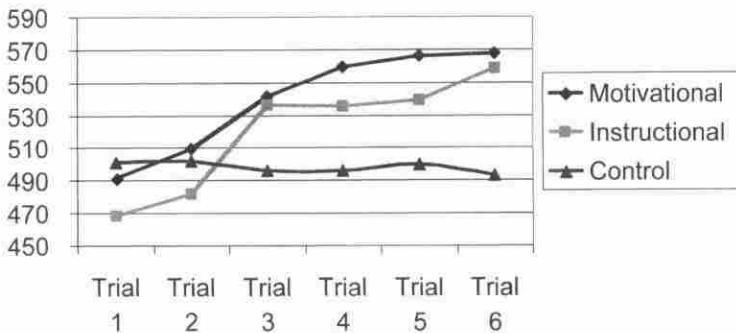


Figure 4 — Performance of the three groups across trials on the isokinetic dynamometer.

Discussion

The present investigation was designed to expand the knowledge base regarding the relationships between different types of self-talk and performance. Specifically, it was hypothesized that motor performance would vary between instructional and motivational self-talk, and that this variability would be affected by the nature of the task being performed. A four-experiment design was employed to manipulate the requirements of the task to allow testing of the above hypotheses.

Consistent with our hypothesis, results of the first two experiments, which employed tasks requiring accuracy, precision, and fine motor coordination (i.e., soccer accuracy pass and badminton serve) indicated that only the participants of the instructional group improved their performance significantly more than the motivational and control groups. Results of the third experiment employing sit-up task revealed no significant differences between the groups as all groups improved performance across trials. Furthermore, in partial support of our hypothesis, the fourth experiment employing a strength task found that both the motivational and instructional groups improved performance significantly more than the control group. It should be noted that when group differences were found in the four experiments, it was usually found only on some of the trials rather than all the trials. Finally, across the four experiments, participants consistently reported that they were using their assigned self-statement when performing the task, and they felt that their self-talk was helpful to them.

Instructional Self-Talk

The results from the present investigation demonstrating the effectiveness of an instructional self-talk strategy is consistent with the few studies that have specifically investigated the use of instructional self-talk in enhancing skilled performance (most studies have focused on positive versus negative self-talk). For example, Rushall et al. (1988), Rushall and Shewchuk (1989), and Harvey et al. (1998) all found that instructional self-talk significantly improved performance in skiing, swimming, and golf, respectively. In the Rushall et al. (1988) study, instructional self-talk improved performance by about 3% (a large increase for elite athletes), although positive self-statements (e.g., "I'm feeling great") and mood words (e.g., "go," "drive") also improve performance as much as the instructional task-focusing cues. In another study, Ziegler (1987) used a set of instructional cues to enhance a narrow focus for tennis players. Specifically, participants were taught to vocalize the word "ball" when they saw the ball fired from the ball machine, the word "bounce" as the ball contacted the surface of the court, and the word "hit" when they observed the ball contacting the racquet. Using a multiple baseline design, participants exhibited a 45% improvement in forehand and backhand ground strokes from baseline.

Using a single subjects design, Ming and Martin (1996) provided four figure skaters with a detailed self-talk package to help them learn and practice their self-talk and integrate it into practice and competition. Results indicated that this instructional self-talk was an integral part of improving the performance of the skaters from baseline to treatment. Interestingly, self-reports a year later indicated that the skaters continued to use the self-talk that they learned during practices, and they believed it enhanced their performance during competitions and tests. Finally, in another study (Mallett & Hanrahan, 1997), instructional self-talk was

used as part of a cognitive race plan to help runners maintain a narrow internal focus of attention. The different self-talk cues (e.g., "push," "heel," "claw") each corresponded to a technical change in sprinting associated with a different segment of the race. Using a multiple baseline design, results revealed that 11 of 12 elite sprinters significantly improved their 100 meter sprint times.

Thus, it appears that instructional self-talk can be effective in a variety of sports and tasks involving fine motor coordination, precision, speed, and strength. In fact, results from the present study revealed that instructional self-talk produced significantly better performance than control conditions on all tasks except the 3-min sit-up, which is predominantly an endurance task. Even in the sit-up task, however, performance in the instructional self-talk condition significantly improved, although the control group also exhibited a significant increase in performance. It is interesting to note that manipulation checks revealed that participants in the control condition generally reported that they were not thinking about anything in particular. Rather, they were just trying to go as fast as they could to complete the most sit-ups in the 3-min period. In addition, the positive effects of instructional self-talk have been demonstrated across ability levels from elite skiers (Rushall et al., 1988) to beginning tennis players (Ziegler, 1987). Furthermore, it is interesting to note that the self-talk provided to participants in the present investigation was not individualized in any manner and might even be considered more "crude" than the self-talk employed in several of the previous investigations. Rather than undermining the findings of the present study, this fact actually makes the case stronger for the potential positive effects of self-talk. Specifically, if such elementary, non-individualized, and non-practiced self-talk can enhance performance, then the potential beneficial effects of individualized, meaningful self-talk that is systematically practiced by athletes would appear to hold great promise in enhancing performance.

Although a definitive explanation for the effectiveness of instructional self-talk in enhancing performance cannot be put forward at this time (since this was not the focus of the present study), other researchers have suggested some interesting possibilities. For example, Hardy et al. (1996) suggest that self-talk may enhance performance through increases in self-confidence and anxiety control. This is certainly the case, for example, in Meichenbaum's (1977) self-instructional training (which is a critical part of his stress-management program) as well as Ellis' (1982) rational emotive therapy. In both approaches, negative or irrational self-talk is thought to increase anxiety and reduce confidence, and thus instructional self-talk is used to help counteract these effects. However, the most often given explanation for the use of instructional self-statements to enhance performance typically revolves around the role of attentional processes. Specifically, in most sports, there is a premium on the ability not only to focus on the relevant cues in the environment, but also being able to maintain that focus. Instructional self-talk serves the function of keeping athletes focused and reminding them of specific technical and mechanical aspects of their skill.

Another way to conceptually look at the attentional focusing aspects of instructional self-talk is through the notion of rule-governed control over behavior (Hayes, 1989; Martin & Pear, 1996). Rule-governed behavior is behavior that is controlled by the statement of the rule and we learn that following these rules leads to positive outcomes. A complete rule is a statement that a specific behavior will pay off in a particular situation. For example, we have been told that if we exercise

and eat correctly, we will be able to keep a desired body weight. Correct use of rules can produce behavior change much more rapidly than trial error experiences with reinforces and/or punishes (Hayes, 1989). The use of instructional self-talk to enhance performance can be conceptualized as use of self-rules to govern behavior. A tennis player, while setting up to serve, might say to herself "reach," and in this way is given herself a partial rule. The complete rule would be "If I reach up with left arm in tossing the ball, I will start to arch my back and begin a smooth full swing." The rule "reach" is an antecedent in the presence of which the behavior of reaching with the ball-tossing hand will lead to reinforce a smooth full swing. Consequently, instructional self-statements constitute partial rules, and the behavior caused by those rules is a form of rule-governed behavior.

Motivational Self-Talk

Regarding the results of motivational self-talk, it was found that it was significantly more effective than a control condition only for strength performance (isokinetic knee extension) with no significant differences on the other three tasks. In addition, as noted above, motivational self-talk was not as effective as instructional self-talk on either of the tasks requiring more coordination and precision (soccer kicking accuracy and badminton serve). It was hypothesized that motivational self-talk would be especially effective on tasks requiring strength and endurance, so only partial support was found for this hypothesis. Much of the literature investigating the effectiveness of self-talk in enhancing performance has focused on positive self-talk versus either negative self-talk or neutral (or no) self-talk. Although the term motivational self-talk was not generally employed, in reviewing previous studies, the specific instructions given to participants in positive self-talk groups (e.g., "hang in there," "you can do it") appear to be similar to motivational self-talk. In essence, the terms motivational and positive self-talk appear to be referring to the same type of self-talk where the focus is on sustaining/increasing effort, increasing desire, building confidence, coping with pain or poor performance, or creating/changing mood.

As noted earlier, there is a fair amount of literature attesting to the beneficial effects of positive self-talk on enhancing performance. The results of the present study partially support these previous findings, as motivational self-talk was only more effective than a control condition for performance of a strength task. For example, Zinsser, Bunker, and Williams (1998) note that two of the major uses of positive/motivational self-talk are to enhance effort and to create an appropriate mood or feelings of confidence. The isokinetic knee extension task is obviously a task where strength is critical and thus bringing forth more effort and creating a sense of confidence with a statement such as "I can do it" would seem consistent with the literature. Although motivational self-talk enhanced strength performance in the present investigation, it is not known whether the underlying mechanism is arousal (or possibly confidence) since this was not measured. Future research should attempt to determine the underlying mechanisms through which increased performance is seen when using motivational self-talk (as well as instructional self-talk).

It was expected that the motivation self-talk group would also significantly improve performance on the endurance task (3-min sit-up). Although the motivational self-talk group significantly improved performance over trials, so did the control and instructional self-talk groups. One possible explanation resides in the

results of the post-experimental questionnaire. Specifically, findings revealed that although the motivational self-talk group were using their assigned self-talk statements, they were not using them as consistently as the instructional group. Perhaps more consistent usage of their motivational self-talk would have produced significant effects when compared to a control group. Additional research is warranted investigating how motivational self-talk might vary by the nature of the task. In addition, in the present study, participants were provided a specific cue to utilize while performing each task. Although the post-experimental questionnaires revealed that participants generally felt their cues were useful, there is no way to account for individual preferences in the specific cues employed.

Conclusions

This is the first investigation that directly compared instructional self-talk to motivational self-talk, demonstrating that instructional self-talk appears to be superior when performing tasks requiring precision, timing, and coordination. In addition, both instructional and motivational self-talk produced significantly better performance than a control condition for a strength task. However, it might be argued that the instructional self-talk provided to participants for the strength task ("stretch fast and strong") might also have served a motivational function. Thus future investigations may want to ensure that motivational and instructional self-talk are clearly differentiated so that their unique effects can be empirically tested.

Another direction for future research would be to investigate self-talk effectiveness from the perspective of individuals' choosing a specific self-talk cue that works best for them. This individual difference approach to mental skills training (where specific mental skills are targeted to athletes' specific needs, preferences, and abilities) has been supported by applied sport psychologists who feel that these skills need to be customized and individualized to individual athletes (Taylor, 1995). In addition, as noted earlier, the significant improvements in the motivational and instructional self-talk groups compared to control conditions were evidenced only on certain trials. Therefore, future research might also investigate the implementation of self-talk strategies over a longer period of time to determine if the effects tend to be mostly early on in performance or if effects become greater and more consistent as more trials are completed and participants start to feel more comfortable with their specific self-statements.

From an applied perspective, the area of self-talk has many applications to sport and exercise settings. Looking at psychological skills intervention programs, as well as the actual use of self talk by athletes in competition, it has been demonstrated that self-talk is a critical component to success, and it appears to be related to other psychological skills such as building confidence, reducing anxiety, and focusing concentration. For example, Gould, Finch, and Jackson (1993) found that the most common coping strategy for national champion figure skaters is rational thinking and self talk. In addition, applied sport psychology consultants consistently utilize self-talk as part of their mental skills training programs (e.g., Halliwell, 1990; Murphy, 1996; Orlick, 1990). Although research indicates that positive self-talk is beneficial to enhancing performance (especially in comparison to negative self-talk), there are few other firm conclusions that can be made

regarding the relationship between self-talk and performance. The present investigation has provided some initial findings regarding the effectiveness of different types of self-talk (e.g., instructional vs. motivational) for different tasks, but many applied questions still remain regarding how, why, where, and under what conditions self-talk influences performance (as well as other potential outcomes such as satisfaction and intrinsic motivation).

For example, in the present investigation, most of the participants had some background in the skills to be performed, although they certainly would not be considered elite or highly skilled. Along these lines, some research has indicated that the use of instructional self-talk could be detrimental to skilled performance if it leads to attempts to consciously control movements that can result in a "paralysis by overanalysis" (Kirschenbaum et al., 1982; Morgan, 1996). In the present study, the instructional self-talk was deliberately very simple and straightforward in nature to avoid this potential overanalysis effect. Thus, athletes and coaches should be careful when using self-talk in applied settings to make sure it is simple, clear, and to the point. The point is that researchers need to help practitioners find empirical answers to these questions so that we can maximize the positive effects of self-talk on not only improving participants' performance, but also enhancing the quality of their sport or exercise experience.

References

- Anderson, A. (1997). Learning strategies in physical education: Self-talk, imagery, and goal-setting. *Journal of Physical Education Recreation & Dance*, **68**, 30-35.
- Dagrou, E., Gauvin, L., & Halliwell, W. (1991). La preparation mentale des athlete ivoiriens: Pratiques courantes de perspectives de recherche (Mental preparation of Ivory Coast athletes: Current practice and research perspective). *International Journal of Sport Psychology*, **22**, 15-34.
- Dagrou, E., Gauvin, L., & Halliwell, W. (1992). Effets du langage positif, negatif et neutre sur la performance motrice. (Effects of positive, negative and neutral self-talk on motor performance). *Canadian Journal of Sport Science*, **17**, 145-147.
- Ellis, A. (1982). Self-direction in sport and life. In T. Orlick, J. Partington, & J. Salmela (Eds.), *Mental training for coaches and athletes* (pp. 10-17). Ottawa, Ontario: Coaching Association of Canada.
- Finn, J.A. (1985). Competitive excellence: It's a matter of mind and body. *The Physician and Sportmedicine*, **13**, 61-75.
- Gallway, W. (1974). *Inner game of tennis*. New York: Sport Science Associates.
- Gould, D., Eklund, R.C., & Jackson, S.A., (1992). 1988 U.S. Olympic wrestling excellence II. Thoughts, and affect occurring during competition. *The Sport Psychologist*, **6**, 383-402.
- Gould, D., Eklund, R.C., & Jackson, S.A., (1993). Coping strategies used by U.S. Olympic wrestlers. *Research Quarterly for Exercise and Sport*, **64**, 83-93.
- Gould, D., Finch, L., & Jackson, S.A. (1993). Coping strategies used by national champion figure skaters. *Research Quarterly for Exercise and Sport*, **64**, 382-402.
- Halliwell, W. (1990). Providing sport psychology consulting services to a professional sport organization. *The Sport Psychologist*, **4**, 369-377.
- Hamilton, S.A., & Fremour, W.J. (1985). Cognitive-behavioral training for college basketball free-throw performance. *Cognitive Therapy and Research*, **9**, 479-483.

- Hardy, L., Jones, G., & Gould, D. (1996). *Understanding psychological preparation for sport: Theory and practice*. Chichester, England: Jones Wiley & Sons.
- Harvey, T., Van Raalte, J., & Brewer, B. (2000). *The effects of self-talk on golf performance*. Manuscript submitted for publication.
- Hayes, S.C. (1989). Rule-governed behavior: *Cognitions, contingencies, and instructional control*. New York: Plenum Press.
- Highlen P., & Bennet, B. (1983). Elite divers and wrestlers: A comparison between open and closed skill athletes. *Journal of Sport Psychology*, **5**, 390-409.
- Johnson-O'Connor, E.J., & Kirschenbaum, D.S. (1986). Something succeeds like success: Positive self-monitoring for unskilled golfers. *Cognitive Therapy and Research*, **10**, 123-136.
- Kirschenbaum, D.S., Ordman, A.M., Tomarken, A.J., & Holtzbauer, R. (1982). Effects of differential self-monitoring and level of mastery on sports performance: Brain power bowling. *Cognitive Therapy and Research*, **6**, 335-342.
- Landers, D.M., & Boutcher, S.H. (1998). Arousal-performance relationship. In J. Williams (Ed.), *Applied sport psychology: Personal growth to peak performance* 3rd Ed. (pp. 197-218). Mountain View, CA: Mayfield.
- Mahoney, M., & Avenier, M. (1977). Psychology of the elite athlete: An exploratory study. *Cognitive Therapy and Research*, **6**, 335-342.
- Mallett, C.J., & Hanrahan, S.J. (1997). Race modeling: An effective cognitive strategy for the 100m Sprinter? *The Sport Psychologist*, **11**, 72-85.
- Manning, B.H. (1988). A categorical analysis of children's self-talk during independent school assignments. *Journal of Instructional Psychology*, **17**, 208-217.
- Martin, G.L., & Pear, J.J. (1996). *Behavior modification: What it is and how to do it* (5th Ed.). Englewood Cliffs, NJ: Prentice Hall.
- Meichenbaum, D. (1977). *Cognitive behavior modification: An integrative approach*. New York: Plenum Press.
- Meyers, A.W., Schlessner, R., Cooke, C.J., & Cuvillier, C. (1979). Cognitive contributions to the development of gymnastics skills. *Cognitive Therapy and Research*, **3**, 75-84.
- Ming, S., & Martin, G.L. (1996). Single-subject evaluation of a self-talk package for improving figure skating performance. *The Sport Psychologist*, **10**, 227-238.
- Mor, D., & Christian, V. (1979). The development of a skill test battery to measure general soccer ability. *North Carolina Journal of Health and Physical Education*, **15**, 30-39.
- Morgan, W.P. (1996). Cognitive strategies in sport and exercise psychology. In J. Van Raalte & B.W. Brewer (Eds.), *Exploring sport and exercise psychology* (pp. 107-130). Washington, D.C.: American Psychological Association.
- Murphy, S. (1996). *The achievement zone*. New York: G.T. Putnam's Sons.
- Nakano, K. (1991). The role of coping strategies on psychological and physical well-being. *Japanese Psychological Research*, **33**, 160-167.
- Nideffer, R.M., & Sagal, M.S. (1998). Concentration and attention control training. In J. Williams (Ed), *Applied sport psychology: Personal growth to peak performance* 3rd Ed. (pp. 296-315). Mountain View, CA: Mayfield.
- Orlick, T. (1990). *In pursuit of excellence*. Champaign, IL: Human Kinetics.
- Raglin, J.S., & Hanin, Y.L (2000). Competitive anxiety. In Y. Hanin (Ed.), *Emotions in sport* (pp. 93-112). Champaign, IL: Human Kinetics.
- Rotella, R., Gansneder, B. Ojala, D., & Billing, J.(1980). Cognitions and coping strategies of elite skiers: An exploratory study of young developing athletes. *Journal of Sport Psychology*, **1**, 350-354.

- Rushall, B. (1984). The content of competition thinking. In W. Straub & J. Williams (Eds.), *Cognitive sport psychology* (pp. 51-62). New York: Sport Science Associates.
- Rushall, B., Hall, M., Roux, L., Sasseville, J., & Rushall, A.C. (1988). Effects of three types of thought content instructions on skiing performance. *The Sport Psychologist*, **2**, 283-297.
- Rushall, B., & Shewchuk, M.L. (1989). Effects of thought content instructions on swimming performance. *Journal of Sport Medicine and Physical Fitness*, **29**, 326-334.
- Scott M.G., Carpenter, A., French, E., & Kuhl, L. (1941). Achievement examinations in badminton. *Research Quarterly*, **12**, 242-253.
- Sellars, C. (1997). *Building self confidence*. Leeds, UK: National Coaching Foundation.
- Solley, B.A. & Payne, B.D. (1990). The use of self talk to enhance children's writing. *Journal of Instructional Psychology*, **19**, 205-213.
- Taylor, J. (1995). A conceptual model for integrating athletes' needs and sport demands in the development of competitive mental preparation strategies. *The Sport Psychologist*, **19**, 205-213.
- Van Raalte, J.L., Brewer, B.W., Rivera, R.M., & Petitpas, A.J. (1994). The relationship between observable self-talk and competitive junior tennis players' match performances. *Journal of Sport & Exercise Psychology*, **16**, 400-415.
- Van Raalte, J.L., Brewer, B.W., Lewis, B.P., Linder, D.E., Wildman, G., & Kozimor, J. (1995). Cork! The effects of positive and negative self-talk on dart performance. *Journal of Sport Behavior*, **3**, 50-57.
- Weinberg, R.S. (1988). *The mental advantage: Developing your psychological skills in tennis*. Champaign, IL: Human Kinetics.
- Weinberg, R.S., Grove, R., & Jackson, A. (1992). Strategies for building self-efficacy in tennis players: A comparative analysis of Australian and American coaches. *The Sport Psychologist*, **6**, 3-13.
- Weinberg, R.S., Smith, J., Jackson, A., & Gould, D. (1984). Effect of association, dissociation, and positive self-talk on endurance performance. *Canadian Journal of Applied Sport Sciences*, **9**, 25-32.
- Ziegler, S.G. (1987). Effects of stimulus cuing on the acquisition of ground strokes by beginning tennis players. *Journal of Applied Behavior Analysis*, **20**, 405-411.
- Zinsser, N., Bunker, L., & Williams, J.M. (1998). Cognitive techniques for improving performance and building confidence. In J.M. Williams (Ed.), *Applied Sport Psychology: Personal growth to peak performance* 3rd Ed. (pp. 225-242). Mountain View, CA: Mayfield.

Manuscript submitted: May 12, 1999

Revision received: March 15, 2000

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